IN THE CLAIMS:

1-22. (Cancelled)

23. (Currently Amended) A polymer optical component comprising:

a synthetic resin substrate having a first surface; and

a ~~gradient zone~~ surface-hardening coating formed on the synthetic resin substrate having a higher concentration layer of ziconia/silica colloid particles adjacent an exterior surface and a ~~progressively~~ lesser concentration tie-bond layer of zirconia/silica colloid particles ~~between~~ at the ~~exterior~~ surface [[and]] of the synthetic resin substrate to provide an attachment to the synthetic resin surface, the zirconia/silica colloid particles are one of a cathodic and anodic polarity while providing an abrasion resistant and water resistant coating.

24. (Original) The polymer optical component of Claim 23 wherein the first surface has a chemabsorbed cathodic layer of zirconia/silica.

25. (Currently Amended) The polymer optical component of Claim 24, wherein three layers are provided in the surface-hardening coating with a first layer including the exterior surface having a zirconia/silica colloid particle concentration of approximately 75% by weight, a second layer adjacent the first layer having a zirconia/silica colloid particle concentration of approximately 10% by weight and a third tie-bond layer adjacent the synthetic resin substrate having a zirconia/silica colloid particle concentration of approximately 15% by weight.

26. (Original) The polymer optical component of Claim 25 wherein the synthetic resin substrate is transparent and a multi-layered reflective coating is provided adjacent a second surface of the synthetic resin substrate to provide a mirror.

27. (Currently Amended) The polymer optical component of Claim [[22]] 23 wherein the synthetic resin substrate is transparent and is configured as a window pane.

28. (Previously Presented) A method of forming a coating on a plastic component comprising the steps of:

providing a synthetic resin substrate of a predetermined configuration;

preparing a liquid sol-gel having a predetermined precursor concentration of zirconia/silica colloid particles;

applying the liquid sol-gel having a predetermined precursor concentration of zirconia/silica colloid particles to the synthetic resin substrate until a predetermined thickness is provided;

permitting the zirconia/silica colloid particles to migrate and orientate in the liquid sol-gel over a predetermined time period by a zeta potential to enable a subsequent formation of an abrasion resistant exterior coating and a tie-bond layer on the surface of the synthetic resin substrate; and

curing the liquid sol-gel to form a solid abrasion resistant exterior coating.

29. (Previously Presented) The method of Claim 28 wherein the liquid sol-gel includes a polysiloxane carrier.

30. (Currently Amended) The method of Claim 29 wherein the precursor zirconia/silica colloid particles forms an approximately 75% concentration by weight adjacent an exterior surface as a first layer.

31. (Currently Amended) The method of Claim 30 wherein a second layer of zirconia/silica colloid particles forms an approximately 10% concentration by weight adjacent the first layer.

32. (Currently Amended) The method of Claim 31 wherein a third layer of zirconia/silica colloid particles forms an approximately 15% concentration by weight between the second layer and the synthetic resin substrate.

33. (Previously Presented) The method of Claim 32 wherein a cathodic chemabsorbed zirconia/silica layer is formed between the third layer and the synthetic resin substrate.

34. (Currently Amended) The method of Claim 28 further including applying a predetermined pH liquid solution to the exterior coating to form one of a hydrophobic and a hydrophilic surface by causing the zirconia/silica colloid particles to be one of cathodic and anodic.

35. (Previously Presented) The method of Claim 28 wherein in the step of preparing a liquid sol-gel, the following sub-steps are performed comprising:

mixing a partial hydrolysis of tetraethoxysilane with a solution including ZrO_2 percursor to consume all of the water to provide a ZrO_2 doped SiO_2 solution; and

dispersing the ZrO_2 doped SiO_2 solution in a polysiloxane liquid carrier.

36. (Previously Presented) The method of Claim 28 wherein in the step of preparing a liquid sol-gel, the following sub-steps are performed comprising:

mixing a full hydrolysis of tetramethoxysilane oligomer in water with a solution including a ZrO_2 percursor in a polar solvent to provide an anatose-type ZrO_2; and

dispersing the anatase-type ZrO_2 solution in a polysiloxane liquid carrier.

37. (Previously Presented) The method of Claim 28 wherein in the step of preparing a liquid sol-gel, the following sub-steps are performed comprising:

mixing sodium metasalicate with water at a balanced pH of 1;

adding zirconyl chloride while stirring;

emulsifying the mixture in ethanol;

adding hexamethylenetetramine and urea;

filter and wash with ethanol to form an anatase ZrO_2 sol-gel; and

dispersing the anatase ZrO_2 sol-gel in a polysiloxane liquid carrier.

38. (Previously Presented) The method of Claim 28 further including the steps of applying a reflective layer to one side of the coated synthetic resin substrate; and

sealing the reflective layer.

39. (New) A plastic component, comprising:

a transparent synthetic resin substrate having an anterior surface and a posterior surface;

a tie-bond layer formed on said anterior surface and said posterior surface of said synthetic resin substrate; and

a multi-layer surface abrasion resistant coating on the tie-bond layer, the multi-layer surface abrasion resistant coating and tie-bond layer are formed by a single wet coating that is cured to provide at least two layers of the surface abrasion resistant coating having respective different concentrations of colloid particles.

40. (New) The plastic component of Claim 39 wherein metal oxide colloid particles are in the single wet coating to form the multi-layer abrasion resistant coating and the tie-bond layer.

41. (New) The plastic component of Claim 40, wherein the multi-layer surface abrasion resistant coating has varying amounts of $Z_v(iPv)_2$ and SiO_2 from said anterior substrate surface to an exterior surface of the multi-layer surface abrasion resistant coating.

42. (New) The plastic component of Claim 39, wherein the two layers provided in the surface abrasion resistant coating include a first layer on an exterior surface having a colloid particle concentration of approximately 75% by weight.

43. (New) The plastic component of Claim 42, wherein a second layer adjacent the first layer has approximately 10% by weight colloid particle concentration.

44. (New) The plastic component of Claim 43, wherein the tie-bond layer has approximately 15% by weight colloid particle concentration.

45. (New) The plastic component of Claim 44, wherein the tie-bond layer is a cathodic chemabsorbed colloid particle concentration formed in the single wet coating of a sol gel.

46. (New) The plastic component of Claim 45 further has a reflective coating.

47. (New) The plastic component of Claim 40, wherein the multi-layer surface abrasion resistant coating has an exterior surface of cathodic colloid particles to provide a hydrophobic coating.

48. (New) The plastic component of Claim 40, wherein the multi-layer surface abrasion resistant coating has an exterior surface of anodic colloid particles to provide a hydrophilic coating.

49. (New) The plastic component of Claim 40, wherein the multi-layer surface abrasion resistant coating has an exterior surface that is enabled to be one of hydrophobic and hydrophilic depending on an applied pH level to the exterior surface.

50. (New) A method of forming an optical component with an abrasion resistant coating comprising the steps of:

providing a synthetic resin substrate of a pre-determined configuration;

preparing a liquid sol-gel having a predetermined precursor concentration of colloid particles;

applying a liquid sol-gel having a predetermined precursor concentration of colloid particles to the synthetic resin substrate until a pre-determined thickness is provided;

permitting the colloid particles to migrate and orientate in the liquid sol-gel by a zeta potential to enable a subsequent formation of an abrasion resistant exterior coating; and

curing the liquid sol-gel to form a solid abrasion resistant exterior coating.

51. (New) The method of Claim 50 wherein the liquid sol-gel includes a polysiloxane carrier.

52. (New) The method of Claim 50 wherein the precursor colloid particles forms an approximately 75% concentration by weight adjacent an exterior surface as a first layer.

53. (New) The method of Claim 52 wherein a second layer of colloid particles forms an approximately 10% concentration by weight adjacent the first layer.

54. (New) The method of Claim 53 wherein a third layer of colloid particles forms an approximately 15% concentration by weight between the second layer and the synthetic resin substrate.

55. (New) The method of Claim 54 wherein a cathodic chemabsorbed colloid particle layer is formed between the third layer and the synthetic resin substrate.

56. (New) The method of Claim 50 further including applying a predetermined pH liquid solution to the exterior coating to form one of a hydrophobic and a hydrophilic surface by causing the colloid particles to be one of cathodic and anodic.

57. (New) The method of Claim 56 further including applying an aqueous solution of approximately 20 percent by weight NaOH to the exterior coating to form a hydrophilic surface.

58. (New) The method of Claim 50 wherein the colloid particles include a metal oxide.

59. (New) The method of Claim 50 wherein in the step of preparing a liquid sol-gel, the following sub-steps are performed comprising:

mixing a partial hydrolysis of tetraethoxysilane with a solution including ZrO_2 percursor to consume all of the water to provide a ZrO_2 doped SiO_2 solution; and

dispersing the ZrO_2 doped SiO_2 solution in a polysiloxane liquid carrier.

60. (New) The method of Claim 50 wherein in the step of preparing a liquid sol-gel, the following sub-steps are performed comprising:

mixing a full hydrolysis of tetramethoxysilane oligomer in water with a solution including a ZrO_2 percursor in a polar solvent to provide an anatose-type ZrO_2 and

dispersing the anatase-type ZrO_2 solution in a polysiloxane liquid carrier.

61. (New) The method of Claim 50 wherein in the step of preparing a liquid sol-gel, the following sub-steps are performed comprising:

mixing sodium metasalicate with water at a balanced pH of 1;

adding zirconyl chloride while stirring;

emulsifying the mixture in ethanol;

adding hexamethylenetetramine and urea;

filter and wash with ethanol to form an anatase ZrO_2 sol-gel; and

dispersing the anatase ZrO_2 sol-gel in a polysiloxane liquid carrier.